

WHAT IS CLAIMED IS:

1. A distributed file system comprising: a storage device for holding files, multiple clients for carrying out file operations on said storage device, a server using tokens to control rights to file reading and writing operations by the client, and a network connecting said clients, said storage device and said server, wherein:

10 said server contains a token revoke request means for sending a token revoke request for demanding the return of a token granting rights to write on said file, to said client holding said token, and

15 said token revoke request means sends a token revoke request containing information on a client requesting said file, and information showing the contents of a token said client is requesting.

2. A distributed file system according to claim 1, wherein said client comprising:

a memory section for holding file data loaded from said storage device; and

20 a data output means for sending a file held in said memory section and relating to said token, to said server of said client requesting said token when said token revoke request is received.

25 3.. A distributed file system according to claim 2, wherein the file for a token from a client, sent to a server

for another client requesting said file token, contains information not already appearing in the latest information in said storage device.

4. A distributed file system according to claim 2,  
5 wherein said token is linked to said file range; and  
said data output means sends data in a range among  
files linked by said token, to said server of said client  
requesting said token; and performs synchronous processing  
on said storage device by writing data in a range among said  
10 files not linked by said token.

5. A distributed file system according to claim 2,  
wherein said data output means decides whether to send said  
token of said held file to said server of the client  
requesting the token, or write said file in said storage  
15 device and perform synchronous processing on said storage  
device, based on the input/output capacity of said network  
and said storage device and/or the data size of said file  
sent to said server of said client requesting the token.

6. A file send and receive method utilized in a  
20 distributed file system comprising: a storage device for  
holding files, multiple clients for carrying out file  
operations on said storage device, a server using tokens to  
control rights to file reading and writing operations by the  
client, and a network connecting said clients, said storage  
25 device and said server, wherein in said method, a client

makes a request to said server for a token for rights to perform operations on a file, and

5           said server sends information on the client requesting a token for said file, and information showing the contents of the token that said client is requesting, in the token revoke request sent to another client holding write operation rights to said file to request the return of the token for said write operation rights.

10         7. A file send and receive method according to claim 6, wherein a client that received said token revoke request, sends the file for said token held in said memory section, to the client requesting the token for said file.

15         8. A file send and receive method according to claim 7, wherein the file for said token sent from said client that received the token revoke request to said server of said client requesting said file does not show the latest information in said storage device.

20         9. A file send and receive method according to claim 7, wherein said token is linked to said file range, and said client that received the token revoke request sends data in a range among files linked by said token to the server of said client requesting said token, and performs synchronous processing on said storage device by writing on said storage device, data in a range among files not linked 25 by said token.

10. A file send and receive method according to claim  
7, wherein said client that received the token revoke  
request, decides whether to send the file being held to the  
server of the client making the request for said token, or  
5 write the file in said storage device and perform  
synchronous processing of said storage device, based on the  
input/output capacity of said network and said storage  
device and/or the data size of the file sent to the server  
of the client requesting the token.

10 11. A client device utilized in a distributed file  
system comprising: a storage device for holding files,  
multiple client devices for carrying out file operations on  
said storage device, a server using tokens to control rights  
to file reading and writing operations by the client device,  
15 and a network connecting said clients, said storage device  
and said server, said client device comprising:

a memory section for holding file data loaded from  
said storage device; and

20 a data output means for sending a file for said token  
holding in said memory section to said client device  
requesting the token for said file when a request for  
returning a token for rights to write on said file is  
received from said server.

12. A client device according to claim 11, wherein  
25 the file for said token sent to said server of the client

device requesting said token, does not show the latest information on said storage device.

13. A client device according to claim 11, wherein  
said data output means sends data in a range among said files  
5 linked by said token, to said server of said client  
requesting said token, and performs synchronous processing  
on said storage device by writing data in a range among files  
not linked by said token.

14. A client device according to claim 11, wherein  
10 said data output means decides whether to send the file being  
held to the server of the client making the request for said  
token, or write the file in said storage device and perform  
synchronous processing of said storage device, based on the  
input/output capacity of said network and said storage  
15 device and/or the data size of the file sent to the server  
of the client requesting the token.

15. A program executed on a server device to control  
tokens for rights to file reading and writing by a client  
connected via a storage device and network, wherein:

20 said program makes the server function as a token  
revoke request means for sending the request for return of  
a token for rights to file writing, to a client holding  
rights to write on a file.

16. A program executed on a client device for  
25 controlling rights to reading and writing of files stored

on a storage device connected by a network, by utilizing tokens managed by a server, wherein:

said program functions as a means for sending files for said token held in said storage section to a client  
5 device requesting said token for said file, when a request to revoke a token for rights to write on said file is sent from said server.